

Think Muscle Newsletter

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Think Muscle Newsletter #9

December 18, 2000 - Number 9

Think Muscle

<http://www.thinkmuscle.com/>

ISSN: 1532-0561

9,227 opt-in subscribers

The Think Muscle Newsletter publishes the latest news and research on exercise physiology, dietary supplements, performance enhancement, lifestyle management, health & nutrition, and bodybuilding & fitness. The newsletter is dedicated to providing accurate and unbiased scientifically based information.

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Protein Pulse Feeding May Revolutionize the Way We Plan Our Meals by Bryan Haycock MS

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When it comes to protein one thing is certain, bodybuilders eat a lot of it. You may have your preferences as to brand or even what source (i.e. egg, whey, casein, soy, meat, goldfish, etc.), but you will be hard pressed to find a bodybuilder or fitness competitor who isn't constantly thinking about where his/her next protein meal is coming from.

I have had many discussions about optimal amounts of protein with my good friend Lyle McDonald. These discussions have led us to believe that despite all our efforts to alter the amount of protein we retain, few if any practices currently being employed by

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bodybuilders actually work. These discussions, along with some recent research, have led me to some conclusions that may surprise you.

A couple of recent studies really got me thinking. A researcher by the name of Marie Arnal out of France had the idea that perhaps you could increase 24-hour protein anabolism by using a diet that was both “high” and “low” in protein. You may ask, “How can a diet be both high and low in protein?” By a method called *protein pulse feeding*. Simply put, you consume about 80% of your daily protein at one sitting, the rest of the day you keep protein intake fairly low (for bodybuilding standards anyway).

Here is what she and her colleagues found. In “elderly women”, nitrogen balance was more positive with the pulse feeding than with protein spread out (54 ± 7 compared with 27 ± 6 mg N/kg FFM/day).(1) Protein turnover rates were also higher with the pulse than with the spread diet (5.58 ± 0.22 compared with 4.98 ± 0.17 g protein/kg FFM/day), *mainly because of higher protein synthesis in the pulse group* (4.48 ± 0.19 g protein/kg FFM/day) than in the spread group (3.75 ± 0.19 g protein/kg FFM/day).

Ok, Ok, many of you are probably thinking that you have nothing in common with elderly women. Just bear with me for a moment. They did the same experiment with 26-year-old women. (2) Surprisingly they found very little effect of protein pulse feeding on nitrogen balance in these young subjects. Keep this in mind...

Finally, they found one other effect of protein pulse feeding. Protein turnover modifications induced by the protein pulse pattern for 14 days persisted at least 1 day after both young and old subjects had stopped the diet. (3) In other words, their bodies became more anabolically responsive to protein meals after utilizing a protein pulse-feeding pattern and this continued for at least a day when normal feeding was resumed.

So in summary, research has shown that in individuals who are aging, protein pulse feeding (i.e. eating most of your daily protein intake at one meal) may lead to greater gains in muscle mass over time by increasing the anabolic effect of a high protein meal, and decreasing catabolism thereafter if protein intake is reduced for the remainder of the day.

Now here is where you might be surprised, when you step back and take a look at what they found, you see that eating protein all day in many small meals, or eating a ton of protein in one big meal, made no difference in nitrogen retention in young women. This makes perfect sense with respect to how the body’s systems have evolved to ensure survival (i.e. by altering metabolism according to nutrient intake). If you eat low protein, your body conserves protein. If you eat protein all the time your body breaks it down, oxidizes it and spits it out. It could very well be that all the fuss bodybuilders make (including myself) about where and when their next protein meal is coming from might be for nothing. It could very well be that it is more anabolic to eat large amounts of protein after training (~80% of daily total) and keep protein around 10-12% of meals there after. Believe it or not, there is other research supporting this hypothesis indirectly. Up until now there has been no use in bringing it up with most bodybuilders because of

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the “tradition” of eating protein in a constant fashion all throughout the day. In time we will see more research on this issue and perhaps Protein Pulse Feeding will become a viable alternative to grazing on meat all day. I can already hear the nay sayers....

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Protein Bars Revealed

By: Rehan Jalali

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For those of us workout buffs and workaholics out there, a high protein bar can save the day (especially a very busy one—sometimes I find myself busier than a one legged man in a butt kicking contest!) The problem is there are so many protein bars out there it’s hard to sort through them all. There seems to be more new bars on the market than web sites going up. But which protein bars are the best? How can they be beneficial? What do you need to know before purchasing them? How about low carb protein bars vs. higher carb protein bars? Well, never fear, the answers you have been looking for are here. Let’s take a closer look at some of the ingredients found in protein bars.

Most of us know that quality nutrition and supplementation is the key to achieving athletic and physique success. It is important to eat 5-7 small meals daily to increase nutrient absorption, enhance metabolic rate, and help stabilize blood sugar (and insulin) levels. High protein meal replacement bars allow you to get all your meals in a convenient and generally tasty manner (I sure don't have the time to cook 6 food meals daily!). They help improve overall nutrition and give you key nutrients your body needs to improve health and physical performance.

Protein bars usually contain protein, carbohydrates, fat, vitamins and minerals, and additional functional ingredients. High protein/moderate to high carb bars are best suited for athletes and workout fanatics looking to get quality protein and carbs for increased energy. They are excellent for after a workout to enhance recovery and recuperation and enhance carbohydrate storage (glycogen) in muscle tissue.

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Most protein bars usually start out with a "proprietary protein blend". Some bars may have only one protein source such as whey protein isolate but it is preferred to get a protein blend to utilize all the functional benefits of different proteins and help support lean muscle mass. Quality whey protein isolate has benefits including providing intact immunoglobulins to support immune function, providing the highest concentration of BCAA's (branched chain amino acids leucine, isoleucine, and valine which play a key role in the muscle building process-about 25%), it has a high biological value (BV) which means it is readily absorbed and utilized by human muscle tissue, and it may even support IGF-1 levels.

It is very important to look at the processing techniques of different whey proteins. The processing will determine whether the important protein microfractions (the compounds that give whey its functional benefits) are still intact and not. Look for ion exchange whey isolate. The ion-exchange process separates proteins based on their electric charge, which is controlled using various chemicals. Two other good choices are "ultrafiltered" or "cross flow microfiltered" whey. Both processes use a very high tech cold microfiltration process that utilizes ceramic filters to remove the fat and lactose thus separating out or "isolating" the protein without damaging it. Whey protein concentrate is a less processed and consequently less expensive form of whey protein. Whey protein concentrate is not as pure as whey isolate in that some fat, lactose and minerals are still left in the protein.

Casein is another milk protein that seems to have a timed-release effect as it forms a gel in the gut to slow the transit time of amino acids. This effect may enhance absorption. It has a very high natural glutamine content. Most of the glutamine in casein is found in the peptide form for better absorption (due to peptide transport systems in the digestive tract). Glutamine is a very important amino acid that has many benefits including supporting lean muscle mass. In a recent study published in the Annals of Nutrition and Metabolism, whey protein was compared with a casein protein hydrolysate (which contains about 20 % glutamine peptides) and a hypocaloric diet with regards to lean muscle mass, strength, and body fat. The results of this study showed that the casein protein hydrolysate group lost more body fat, gained more lean muscle mass, and had greater strength increases. The authors of the study stated that, "this significant difference in body composition and strength is likely due to improved nitrogen retention and overall anti-catabolic effects caused by the peptide components of the casein hydrolysate". Milk protein isolate contains both whey and casein and it is a decent source for these two proteins.

Soy protein isolate has been shown to enhance thyroid hormone output, which can increase metabolic rate to support fat loss. The isoflavones in soy have been shown to have numerous health benefits including cholesterol and triglyceride lowering effects. It contains an excellent ratio of glutamine, arginine, and the BCAA's. It is a fairly low priced protein source and can have positive benefits for women mainly, but men as well.

Egg albumin protein is the "regular old Joe" protein. It boasts a great amino acid profile but does not offer very many functional benefits. Hydrolyzed protein is also another

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source of protein found frequently in bars because it is inexpensive. This protein is heat-treated (and pre-digested) and most of the microfractions are destroyed. However, it does contain peptides that are easily absorbed in the body.

Most high protein bars on the market are not baked nowadays so if the raw materials were quality, then the protein microfractions stay intact. However, the raw material ingredients that make up a bar may have been subjected to heat. Ask manufacturers of bars to provide you with certificates of analysis for the proteins in the bar (and for the bar itself for that matter). This should give you peace of mind about the quality of the protein you are getting. Bars that contain rolled oats and some granola type bars are baked and the proteins in them lose the microfractions due to baking.

The basic bar making process from a quality manufacturer goes like this: first the main ingredients (including the proteins) are mixed together (manually or using an industrial sized mixer) with water, then the mixture is laid on a table evenly and goes through a “cooling” machine process using a cooling tunnel/extruder. Next, the bar is taken out of the cooling machine and enrobed (coated) with chocolate. Finally, the bar sheets are cut and ready to be wrapped. Keep in mind this is a greatly simplified explanation of the process.

Protein bars contain carbohydrates as well. Typically the main source is glycerol (glycerine) which is a trihydric alcohol. Glycerol forms the backbone of triglycerides in the body. It is used in bars to help keep them soft and moist since glycerol is very good at drawing moisture. It also helps sweeten the bar. Although many companies do not list this as a source of carbohydrates, the FDA defines it as a carbohydrate. It has a very low glycemic index so it does not impact blood sugar levels greatly. Interestingly enough, there are ergogenic benefits associated with ingesting glycerol such as increasing the amount of water retained in the body and enhancing hydration (maybe even enhancing vascularity). Bars loaded with glycerol may cause stomach discomfort in some people so unless you want to hit the porcelain throne throughout the day, drink plenty of water with these protein bars. Corn syrup, high fructose corn syrup (dextrose), rice syrup, maltitol, honey (invert sugar), turbinado sugar, sucrose (which is glucose +fructose), crisp rice, and fructose are all used as carbohydrate sources in bars. Fructose is fruit sugar and is added to bars not only to provide a source of carbohydrates but also to sweeten the product as it has a very sweet taste. Fructose is mainly metabolized in the liver and therefore has a lower glycemic index. Consuming high amounts of fructose can lower metabolic rate and cause de-novo lipogenesis (the conversion of sugar into fat) since the liver can only metabolize limited amounts of fructose.

Protein bars also contain fat. The usual fats found in these bars are partially hydrogenated oils, fractionated vegetable oils, palm kernel oil, and peanut butter. A few bars have added essential fatty acids (EFA's) but it is very difficult to preserve the quality due to their sensitivity to light, heat and oxygen. Most of the fat (especially the saturated fat) found in bars is in the coating. Saturated fats have been linked to many health problems including cardiovascular disease. Partially hydrogenated oils produce trans fatty acids (along with other altered fats) during the hydrogenation process. They are also very

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detrimental to health and have been known to increase cholesterol and interfere with the livers detoxification system. Hydrogenated oils increase shelf life of products, which is usually 9 months to 1 year for most protein bars. Fractionated oils seem to be better for you. Fractionation is the process of separating an oil into two or more different triglyceride fractions. In other words, it allows weaker oils to be changed into better oils.

Protein bars contain a blend of vitamins and minerals to support overall health and many chemical processes in the body. Pre-mixes from companies like Roche are usually added to formulas. Vitamins and minerals are usually ancillary items to bars and many minerals in the formulas actually compete for absorption like calcium and magnesium plus they are generally not in the higher absorbable chelated forms. Chromium is added to some bars (usually in the better polynicotinate form) to support optimal blood sugar levels and help aid in fat loss.

Some high quality bars on the market (for various purposes including post workout recovery, energy, and lower carb/high protein bars) include: LoCarb2 from BIOCHEM, Lean Body by Labrada, BioComplete by Bodylogix, Protein Plus from Powerbar, Lean Machine bars by GEN, Meso-Tech bars by MuscleTech, Met-Rx Food bars by Met-Rx, LoCarb sports bar by APT Nutrition, Myoplex Lite bars by EAS, and the Ultimate Protein Bar by BIOCHEM.

In the future, we will evaluate popular bars on the market and give them a rating based on various criteria.

*References available upon request.

About the Author

Rehan Jalali is the President of the Supplement Research Foundation (<http://www.tsrf.com>), a company dedicated to advancing the science behind dietary supplements for ergogenic benefit. He is a biochemist, published scientific writer and author, sports nutritionist, industry recognized product formulator and nationally ranked competitive natural bodybuilder. He can be reached via the internet at rehan@thinkmuscle.com.

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Reader Survey

Tell Us What You Think?

1. Protein Pulse Feeding May Revolutionize the Way We Plan Our Meals by Bryan Haycock MS

- It was good.
- It was okay.
- I didn't like it.
- I'm not interested.

2. Protein Bars Revealed by Rehan Jalali

- It was good.
- It was okay.
- I didn't like it.
- I'm not interested.

3. What type of articles would you like to see in the future? (Check all that apply.)

- Anabolic Steroids and Pharmaceuticals
- Anti-aging medicine
- Body Transformation
- Children's Health and Nutrition
- Competitive Bodybuilding
- Diet and Nutrition Reviews
- Dietary Supplements
- Exercise Physiology
- Fitness Competitions
- Fitness Psychology
- General Health Topics
- Lifestyle Management
- Men's Health
- Powerlifting
- Seniors Health Topics
- Sports Specific Training
- Women's Health and Nutrition

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We hope you have enjoyed the latest issue of the Think Muscle Newsletter. Suggestions? Comments? Questions? We'd love to hear them!

Best regards,

The Think Muscle Editorial Staff

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